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(21) International Application Number: PCT/SE98/02002 (22) International Filing Date: 5 November 1998 (05.11.98) (30) Priority Data: 9704078-6 7 November 1997 (07.11.97) SE (71) Applicant: TELIA AB (publ) [SE/SE]; Mårbackagatan 11, S-123 86 Farsta (SE). (72) Inventors: CHRISTENSEN, Maria; Brännberg pl 514, S-961 95 Boden (SE). ISAKSSON, Lennart; Andersvägen 5, S-954 35 Luleå (SE). (74) Agent: PRAGSTEN, Rolf; Telia Research AB, Vitsandsgatan 9, S-123 86 Farsta (SE).		(81) Designated States: EE, LT, LV, NO, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>Without international search report and to be republished upon receipt of that report.</i>
(54) Title: IMPROVEMENTS IN, OR RELATING TO, ELECTRONIC PAYMENT SYSTEMS <div style="text-align: center;"> </div> (57) Abstract <p>The electronic payment system handles financial settlement of transactions, between consumers and merchants, relating to products/services purchased by the consumers from the merchants via an electronic trading medium, such as the Internet, and is supported by a telecommunication architecture adapted to provide a plurality of electronic payment schemes. Each one which is indigenous to a different country and adapted to operate, nationally, as a single-scheme, independently of the other schemes, in accordance with a common set of rules. Each payment scheme has an electronic account, owned and controlled by an operator of the scheme. An inter-scheme conversion and cross-currency exchange facility is provided for the electronic payment schemes which enables merchants subscribing to each of the national schemes to trade with subscribing consumers, irrespective of the payment scheme to which the consumers subscribers, or the consumer's unit of account and currency. Each of the scheme-specific electronic accounts is adapted to receive payments from a subscribing consumer, for products/services purchased from a merchant, in the consumer's currency, and to make corresponding payments to a scheme-specific electronic account, to which said merchant subscribers, in a currency selected by said merchant.</p>		

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Improvements in, or relating to, Electronic Payment Systems

The invention relates to an electronic payment system and, in particular, to a telecommunications network, the architecture of which is adapted to support the electronic payment system. The electronic payment system is primarily intended for micro and pico payments. The invention also relates to a telecommunications system for facilitating electronic trading on the Internet.

The concept and architecture of a telecommunications network, on which the electronic payment systems of the present invention are based, will be outlined, in the subsequent description, together with the information flows necessary to give effect to the systems.

Electronic trading on the Internet, i.e. the selling of information, products and services over the Internet to a Pan-European and/or global market, is expected to increase dramatically over the next few years. A number of different electronic payment systems have been developed, for Internet trading, to meet different needs, i.e. the nature of the known electronic payment systems is dependent upon the different requirements imposed on such systems by trading in different products and/or services.

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The known electronic Internet payment systems can be broadly classified into three systems, namely:

- (a) before purchase, i.e. using a telephone card-type payment system, where the customer/purchaser makes an advanced payment for the required products/services;
- (b) at the time of purchase, i.e. using savings bank-type payment card, where the customer/purchaser makes payment for the required products/services when a purchase is being made; and
- (c) after purchase, i.e. using a credit card-type payment system, where the customer/purchaser makes payment for the required products/service after the

required products/services have been provided by the seller/service provider.

Another factor to be taken into account with electronic payment systems is the size of the payment, i.e. the payment size imposes different requirements on security and cost-effective handling. As a consequence of this, electronic payment systems are normally classified into:

- micro payments, i.e. payments of less than around 10 US dollars (US\$10);
- 10 - midi payments, i.e. payments from around US\$10 to several hundred dollars; and
- payments of large amounts.

15 Pico payments are frequent payments for very small amounts, i.e. from a single öre up to several SEK (Swedish Kronor). Furthermore, pico payments require a very flexible electronic payment system which can process payments very quickly.

As for medium-sized payments, using a debit/credit-type of payment system, i.e. involving payments of around US\$ 10 and upwards, the SET standard, in combination with a number of major players, for example, VISA, Mastercard and suppliers such as IBM, is capable of providing payment solutions which operate well at a global level for both customers and sellers/service providers.

25 An ATU technical working group have privately developed an electronic payment system, ATU-NET, for making global electronic commerce available for the mass market. However, whilst details concerning the concept, architecture and information flows, underlying the ATU-NET, are only available to members of the ATU consortium, on a strictly confidential basis, these details will be outlined in the subsequent paragraphs to the extent necessary for an understanding of the present invention. In essence, ATU-NET makes it possible for consumers to purchase information, products and services from merchants irrespective of which electronic payment scheme the merchants use and/or which currencies the merchants support. The electronic payment

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system architecture of ATU-NET offers inter-scheme conversion and cross-currency exchange which makes it possible for merchants to sell to a Pan-European and/or global market without the need to consider which electronic payment scheme and currency the consumers are able to, or would like to, use for a transaction. The inter-scheme conversion and cross-currency exchange, provided by ATU-NET, makes it possible for global electronic commerce to become a reality for the mass market.

The ATU-NET is primarily concerned with cash card payment schemes which give the possibility to use efficient payment methods, such as prepaid jetons stored in wallets, or in cards.

With electronic payment systems, there is a need to be able to switch between different payment systems and currencies for micro payments. In the case of micro payments and electronic cash cards, a number of electronic payment systems have already been established and are set to take a share of the market. For example, Proton/Cash Card, Euro Chip, Chipper, and Mondex are some examples of products which are already well-established. Moreover, with these systems, the customer will load his, or her, own card in national currency. It is, therefore, becoming very complex and expensive for an individual merchant/dealer to provide the required functionalities on his/her own commercial World Wide Web site (www-site) to enable any customer, whatever his/her geographic location (Pan-European and/or global), to purchase the information, products, or services which the merchant/dealer is offering for sale on the Internet.

It will be seen from the subsequent description of the electronic payment system of the present invention that the system is adapted to handle pico payments, as well as micro payments, although the detailed description is primarily concerned with micro payment systems.

Since the number of transactions, expected to occur with electronic trading on the Internet, primarily by information services within the amounts handled by micro payments, are expected to be very high, an inter-scheme conversion and cross-currency exchange service, i.e. as provided by ATU-NET, will be of very great value to

merchants/dealers and to network operators. In particular, the provision of ATU-NET services by network operators will enable merchants/dealers to gain access to the global electronic trading market for their products/services and enable the network operators to generate income from use of the services.

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In order to be worthwhile for micro payments, an inter-scheme conversion and cross-currency exchange service must be extremely cost-effective and provide short response times for purchases, because each purchase will involve the payment of relatively small amounts, i.e. normally from one SEK up to, at most, US\$10.

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On the basis of the requirements for cost-effective realisation and very short response times for effecting transactions, telecommunication operators, such as Telia, rather than the banks, are best-suited to operate the service, because the banks do not have an infrastructure that meets these requirements. A basic prerequisite, when the service was devised, was that it should not be allowed to create conflicts with the banks. This condition is met. The service is, therefore, structured in such a way that it is executed, operationally, through interplay with the banks, when transactions are to be effected between the cash registers which the ATU-Connected Domains (ATU-Payment Server) have available and the bank accounts which merchants/dealers have in the banks to handle received payments. Operators of the service, such as Telia and its business partners in AT&T/Unisource alliance, will have bank accounts in different countries for transfer of money so that the different cash registers in the ATU-Connected Domains can be topped up as necessary.

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It will be seen from the subsequent description that the inter-scheme conversion and cross-currency exchange service of the present invention makes it possible to generate income from global trading and, in particular, from trading between Europe and USA, for example, between the network operators involved in the creation/development of ATU-NET. In other words, since AT&T forms part of the AT&T/Unisource alliance, it is possible for AT&T and any one, or more, of the Unisource members, for example, Telia, to offer this type of inter-scheme conversion and cross currency exchange service at the global level, including the USA. This is extremely important, since a large flow of trade, especially concerning information services and software, passes from the USA to

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Sweden. This service will, therefore, allow Swedish customers to purchase, in the USA, products and services, which are priced in US dollars, for SEK stored, for example, in a cash card, such as, Sparbanken, S-E Banken, and Handelsbanken which are about to be launched in Sweden.

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The business logic of the present invention is that provision of the inter-scheme conversion and cross-currency exchange service, will enable a network operator, such as Telia, to receive a percentage share of the value of the purchase product/service, from the merchant/dealer, when an inter-scheme conversion takes place. This is justifiable, because the service provided by the network operator has enabled the merchant/dealer to sell a product/service to a customer, who would not otherwise have been able to purchase the product/service because the customer's unit of account is not the same as that which the merchant/dealer is able to support.

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If the purchase includes a currency exchange, the operator of the inter-scheme conversion and cross-currency exchange service, for example, Telia, will be entitled to receive a payment from the customer for the currency exchange. Since it is common practice to charge a commission for currency exchanges, the customer will consider that such payments are part of normal trading practices. In practice, the payments received by an operator will be used, at least in part, to offset the operator's charges for the transfers between its own bank accounts which will be required to top up the cash registers of the ATU-Connected Domains, as necessary.

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It is an object of the present invention to provide a telecommunications network adapted to support an electronic payment system, particularly for electronic trading on the Internet, in which the ATU-NET service is interfaced to the product/electronic purse payment systems of customers and merchants. The electronic payment system is primarily intended for micro and pico payments.

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It is another object of the present invention to provide a telecommunications system for facilitating electronic trading using an electronic medium, such as the Internet, including an electronic payment system which provides the ATU-NET service and which is supported by the telecommunications network of the present invention.

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According to one aspect of the present invention, there is provided, a telecommunications network for handling financial settlement of transactions between consumers and merchants using an electronic payment facility, said transactions relating to products/services purchased by said consumers from said merchants via an electronic trading medium, such as the Internet, each of said merchants having a www-site at which products/services are offered for sale to said consumers via said electronic trading medium, each of said consumers having an access unit for accessing said www-sites, characterised in that said network includes activation means for operation by a consumer having an interest in purchasing selected products/services from a merchant; pricing means for presenting to said consumer, in response to operation of the activation means, a price required for said selected products/services in a unit of account and currency normally used by said merchant, said payment means being adapted to present said price in another currency, if required by said consumer; payment means for presenting to said consumer a list of electronic payment schemes supported by said electronic payment facility; selection means for operation by said consumer to select and confirm a preferred electronic payment scheme from said list; transaction means for accepting, from said consumer, payment for said selected products/services using said selected and confirmed electronic payment scheme, and for crediting an electronic account of said merchant with an amount corresponding to the payment made by said consumer, said transaction means being owned and controlled by an operator of said electronic payment facility and adapted to support said consumer's and said merchant's unit of account and currency; transfer means for transferring payment for said selected purchase from said electronic account to a bank account of said merchant, said payment being in the currency used by said merchant; and confirmation means for informing said merchant that payment has been received from said consumer and that said selected products/services can be delivered to said consumer. The transfer means may be adapted to defer crediting said merchant's bank account with an amount corresponding to the payment made by said consumer until after said consumer has taken delivery of said products/services and said merchant's conditions of sale have been fulfilled/acknowledged by said consumer.

The telecommunication network may be adapted to debit said consumer's

electronic account by an amount coected products/services, hold said debited amount in escrow and, after said consumer has taken delivery of said selected products/services and all conditions of sale have been complied with by said merchant, credit an electronic account associated with said merchant.

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The activation means may include a payment icon displayed on a display screen of said consumer's access unit when said consumer accesses the www-site of said consumer, said icon being clicked by said consumer to indicate an interest in purchasing said selected products/services from said merchant.

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The pricing means may be adapted to present, to said consumer, the price for said selected products/services in his/her own currency, in the event that the price provided by said merchant is in another currency. The pricing means may include currency exchange lists for the currencies of said merchant and said consumer, said
15 lists being updated on the basis of a currency exchange rate prevailing at the date of purchase of said selected products/services; and calculation means adapted to use said currency exchange lists to transpose the price for said selected products/services from said merchant's currency to a currency selected by said consumer. With this arrangement, the transaction means may be adapted to accept payments in a currency
20 selected by said consumer, and to credit said electronic account of said merchant with an amount, corresponding to the payment made by said consumer, in the currency of said merchant.

The telecommunications network may be adapted to handle financial settlement
25 of transactions between consumers and merchants who are subscribers to the same electronic payment scheme, operated by a single network operator, or to different electronic payment schemes operated by different network operators, all of said schemes operating in accordance with a common set of rules, enabling said network operators to conduct business in a homogeneous manner. Each of the payment
30 schemes is indigenous to a different country and is adapted to operate, nationally, as a single-scheme, independently of the other schemes. The network preferably includes inter-scheme conversion and a cross-currency exchange means adapted to enable subscribing merchants, in each of the different countries, to sell products/services to

consumers in any one of the other countries, irrespective of a consumer's currency. Each electronic payment scheme may include a scheme-specific payment server for making payments, via a payment gateway, for products/services selected by a consumer, said payments being credited to an electronic account of a merchant from whom the products/services have been purchased. The scheme-specific payment servers of each of said electronic payment schemes, operating in accordance with a common set of rules, may be federated, said federation being adapted to interconnect said scheme-specific payment servers and a centralised master server for generic payment methods, managing centralised services and developing new generic features and/or services for said network. The generic payment methods may include, inter alia, pico payments and international payment schemes, and in that said centralised services include, inter alia, a foreign exchange rate server.

The single-scheme may includes a MAS-PS for presenting, to said consumer, a record, or summary, of the selected purchases; a final, all-inclusive, price to be paid for said purchases; and a list of electronic payment schemes supported by said network, said consumer selecting a payment scheme, from said list, for making payment for said purchases. With this arrangement, the MAS-PS activates said scheme-specific payment gate and transfers payment for said purchases, in electronic form, from an electronic card/wallet of said consumer to an electronic account/cash register of said merchant and thereafter to a bank account of said merchant.

The inter-scheme conversion and a cross-currency exchange means may be adapted to use two different electronic payment schemes, each managed by a different payment gateway, and in that a merchant, from whom a consumer wishes to purchase products/services, is a subscriber to one of said electronic payment schemes and the consumer is a subscriber to the other of said electronic payment schemes. With this arrangement, the electronic payment scheme, supported by said merchant, may include a MAS-PS for presenting, to said consumer, a record, or summary, of the selected purchases; a final, all-inclusive, price to be paid for said purchases; and a list of electronic payment schemes supported by said network, said consumer selecting a payment scheme, from said list, for making payment for said purchases. The MAS-PS is adapted, on determining that payment for said purchases will be made via a payment

gateway responsible for management of said electronic payment scheme supported by said consumer, to forward a request for payment to a scheme-specific payment server adapted to handle a Consumer's Requested Scheme (CRS). The electronic payment scheme, supported by said consumer, may include a CRS-PS adapted to send, to a

5 CRS-PG, an inquiry for transfer of payment for said purchases, said transfer being declared valid and performed, when presented according to CRS standards and provided there is sufficient electronic value in said consumer's electronic wallet/purse to cover said purchases, an electronic value of said payment being sent by said consumer to said CRS-PG. The CRS-PS may be adapted, before sending said inquiry to said

10 CRS-PG, to check whether a payment scheme selected by said consumer can accept the amount presented for payment; if said consumer decides to change a method of payment for said purchases, check whether a MAS is associated with a receiving payment gateway; check that a MAS-PG is operational; and present, to said consumer, an updated acceptance form for said transaction, taking into account the latest

15 exchange rates for the currencies involved, and including all fees incurred by using said electronic payment scheme offered by said network. The CRS-PS may be adapted to make said MAS check, in the event that a consumer changes said payment method because a previously selected payment method cannot accept an amount presented for payment.

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The CRS-PS may be adapted to determine whether said MAS-PG is operational by checking that a connection initiated by said MAS-PS has not failed.

The CRS-PG may be adapted to credit an amount, corresponding to said

25 payment received from said consumer for said purchases, to a bank account owned and controlled by said CRS-PG.

The CRS-PS may be adapted to create a payment order, based on stored data concerning said transaction; and send said payment order, in a format defined by said

30 centralised master server, via a communication network to a MAS-PS associated with said MAS-PG. The MAS-PS may be adapted to receive said payment order from said CRS-PS and convert it from inter-linking standards into its own standards, and make payment to said merchant, in accordance with said payment order, using its own

associated electronic wallet. The electronic wallet of said MAS-PS may be a card-based electronic wallet. The MAS-PS may be adapted, in the event that a value remaining in said card-based electronic wallet is insufficient to cover said payment order, to load said wallet from its own bank account, according to predefined rules. The electronic wallet
5 may be adapted to transfer, via an associated MAS-PG, electronic values, required to fulfill said payment order, to a cash register of said merchant, cash register being adapted to periodically transfer electronic monetary values held therein to a bank account owned by said merchant. With this arrangement, the network is adapted to inform said merchant concerning completion of said payment transaction.

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Each payment server preferably owns and controls a bank account, and each CRS-PS may be adapted to periodically, and according to a predefined bookkeeping process, instruct an associated bank to transfer funds, denominated in Euro, from its account to a bank account, associated with MAS-PSs with which each CRS-PS has
15 been dealing, said transfers being for an amount equivalent to a total value of said payment order(s).

Depending on conditions of sale established for said merchant, said CRS-PS may be adapted to delay creation of said payment order in order to ensure that said
20 conditions of sale have been complied with by said merchant.

Payment mechanisms supported by said electronic payment schemes may include pre-paid jeton cards issued by either an operator of said electronic payment facility, or by banks. Jeton cards issued by banks may include cash cards, SET, Proton
25 and Modex.

According to another aspect of the present invention, there is provided, a telecommunications system for trading using an electronic medium, such as the Internet, in which subscribers to said system include merchants having a www-site for offering
30 products/services for sale, and consumers having an access unit for accessing said www-sites to purchase said products/services from said merchants, characterised in that said system includes an electronic payment system supported by a telecommunications network as claimed in any of the preceding claims.

The telecommunications system may be adapted to handle financial settlement of transactions between consumers and merchants who are subscribers to different electronic payment schemes operated by different network operators, each of said schemes being indigenous to a different country and adapted to operate, nationally, as a single-scheme, independently of the other schemes, all of said schemes being adapted to operate in accordance with a common set of rules, enabling said network operators to conduct business in a homogeneous manner. The system is adapted to offer each of said nationally operated electronic payment schemes to subscribing consumers and merchants in the respective countries. The electronic medium may be provided by the Internet and, in this case, each of said consumers subscribe to an Internet access provider and an Internet service provider in their respective countries, and each of said merchants subscribe to an Internet access provider, an Internet service provider and an electronic payment service provider in their respective countries.

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The consumer access units may each include a personnel computer (PC) having a display screen, and a data modem and associated software for accessing, and trading at, said www-sites of said merchants.

According to another aspect of the present invention, there is provided, a telecommunications network for handling financial settlement of transactions between consumers and merchants using an electronic payment facility, said transactions relating to products/services purchased by said consumers from said merchants via an electronic trading medium, such as the Internet, each of said merchants having a www-site at which products/services are offered for sale to said consumers via said electronic trading medium, each of said consumers having an access unit for accessing said www-sites, characterised in that said electronic payment facility is supported by a telecommunications architecture adapted to provide a plurality of electronic payment schemes, each one of which is indigenous to a different country and adapted to operate, nationally, as a single-scheme, independently of the other schemes, in accordance with a common set of rules, each of said nationally operated payment schemes having an electronic account, owned and controlled by an operator of said scheme; and an inter-scheme conversion and cross-currency exchange facility for said electronic payment

schemes that enables merchants subscribing to each of said national schemes to trade with subscribing consumers, irrespective of the payment scheme to which said consumers subscribers, or the consumer's currency, each of said scheme-specific electronic accounts being adapted to receive payments from a subscribing consumer, for products/services purchased from a merchant, in said consumer's currency, and to make corresponding payments to a scheme-specific electronic account, to which said merchant subscribers, in a currency selected by said merchant. With this arrangement, the telecommunications network may include transfer means for transferring payments received by a scheme-specific electronic account for a subscribing merchant to a bank account of said merchant, said payment being in the currency used by said merchant; and confirmation means for informing said merchant that payment has been received from said consumer and that said selected products/services can be delivered to said consumer.

The foregoing and other features of the present invention will be better understood from the following description with reference to the accompanying drawings, in which:

Figure 1 diagrammatically illustrates, in the form of a block diagram, a scheme specific payment gateway architecture;

Figure 2 diagrammatically illustrates, in the form of a block diagram, an ATU-NET and its domains;

Figure 3 diagrammatically illustrates, in the form of a block diagram, the ATU payment system architecture;

Figure 4 diagrammatically illustrates, in the form of a block diagram, the ATU-NET architecture and message flows for a single-scheme electronic payment system;

Figure 5 diagrammatically illustrates, in the form of a block diagram, the ATU-NET architecture and message flows for an inter-scheme electronic payment

system;

Figure 6 diagrammatically illustrates, in the form of a block diagram, the ATU-NET message flows; and

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Figure 7 diagrammatically illustrates, in the form of a block diagram, an electronic payment system of the present invention.

10 In order to facilitate an understanding of the present invention a glossary of terms used in this patent specification is provided below:

AP:	Access Provider
ATU:	AT&T/Unisource
15 ATU-NET:	ATU Electronic Payment System Architecture
ATU_PS_C:	Message flow from the CRS-PS side
20 ATU_PS_M:	Message flow from the MAS-PS side
CRS:	Consumer Requested Scheme
CRS-PS:	CRS Payment Server
25 CRS-PG:	CRS Payment Gateway
DVP:	Delivery Versus Payment
30 ECSP:	E-Commerce Service Provider
E-Commerce:	Electronic Payment Scheme

	IS:	Instruction System
	ISP:	Internet Service Provider
5	MAS:	Merchant Associated Scheme
	MAS-PS:	MAS Payment Server
	MAS-PG:	MAS Payment Gateway
10	OTC:	One Telecom Country
	PC:	Personnel Computer;
15	PG:	Payment Gateway
	PS:	Payment Server
20	SET:	Secure Electronic Transactions
	SVS:	Stored Value System
25	www:	World Wide Web

In essence, the ATU-NET service of the electronic payment system of the present invention is interfaced to the product/electronic purse payment systems of customers (consumers) and merchants (dealers).

30 It will be seen from the subsequent description of the electronic payment system of the present invention that the ATU-NET is primarily used for cash card payment schemes. These payment schemes give a user the possibility to use efficient payment methods, for example, prepaid jetons stored in wallets, or in cards. The present

invention is, therefore, primarily concerned with the mechanisms involved in electronic commerce (E-Commerce) payment transactions based on the above-mentioned payment methods, particularly for micro and pico payments.

5 The ATU-NET is, as stated above, adapted to offer inter-scheme conversion and cross currency exchange, which makes it possible for merchants to sell information, goods (for example, software, applets, images, etc..) and services over the Internet to a global, and/or Pan-European, market without the need to consider which payment scheme and currency the consumers (purchasers) would like to use, or are able to use.

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 In a commercially-viable, electronically-implemented, trading system for the Internet, the payment system is the component that handles all tasks related to the financial settlement of a transaction between a consumer (purchaser) and a merchant (seller). This financial transaction normally completes the merchant-related actions of a
15 consumer, when he/she has completed his/her "shopping", i.e. browsing catalogue pages of the products offered by the merchant, selecting items to buy, and completing the process by reviewing a final form summarizing his/her purchases, together with the related prices, discounts, delivery costs and taxes. As a minimum, the electronic payment system comprises a payment server (i.e a hardware/software combination) for
20 handling the requested settlement (i.e. an act that discharges obligations in respect of funds, or securities, transferred between two, or more, parties). The payment system may, however, include further features that allow better consumer and merchant handling, for example, customer care, billing, data mining, etc.. In practice, these further features are included in the electronic payment systems as, and when, required, i.e. the
25 electronic payment systems are customized for each application, and generally rely heavily on the use of databases.

 It will be seen from the subsequent description, with reference to the accompanying drawings, that the ATU payment server, which is associated with a
30 merchant host and an existing payment server, is responsible for routing the transaction to an appropriate, i.e. remote, ATU payment server whenever it is not capable of locally handling a consumer's preferred method of payment.

It will also be seen from the subsequent description that the ATU payment system consists of all its deployed payment servers. The ATU payment server acts as a switch, enabling a transaction to be effected in accordance with the payment method selected by the consumer. As is diagrammatically illustrated in Figure 1 of the
5 accompany drawings, the transaction is achieved using an existing scheme-specific payment gateway.

As illustrated in Figure 1, the payment gateway acts as the:

- 10 - interface between an Internet-based system, for example, a card reader connected to a personnel computer (PC) which is connected to the Internet and adapted to access the www-sites of merchants subscribing to the electronic trading system; and
- 15 - traditional regulated network for financial services, i.e. the banking system.

As illustrated in Figure 1, the payment gateways are adapted to cater for a number of payment systems, including Mondex, SET and Proton.

20 The objective of the ATU Payment System is to enable consumers and merchants to conduct electronic trading through use of the following:

- inter-scheme conversion and cross-currency exchange;
- 25 - a sound, secure and cost efficient architecture to settle international real-time payments; and
- a Delivery Versus Payment (DVP) architecture that guarantees the customer and merchant fair exchange of value and goods.

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Each ATU payment server needs to know about the location, i.e. network address, and properties, i.e. supported currency and payment scheme, of the various scheme-specific payment gateways. Furthermore, in order to provide a cost effective

arrangement for setting up the various merchant domains, i.e. the merchant server and its associated payment server, it is desirable, as illustrated in Figure 2 of the accompanying drawings, that the ATU payment servers should be federated. In other words, such an arrangement requires the establishment of a collective payment
5 structure having a common set of rules agreed by all parties, enabling them to conduct business in a homogenous manner. Membership of such a structure would, therefore, require all parties to agree to, and abide by, the common set of rules. This federation of ATU payment servers will interconnect isolated merchant domains (payment servers), which can handle bank and broker-specific payment schemes, and a centralized ATU
10 master domain for generic payment methods, such as, pico payments, international payment schemes, etc.. The ATU master domain is also the natural and cost-efficient location for managing centralized services, such as, for example, a foreign exchange rate server and the development of new generic features and/or services.

15 A benefit of this payment scheme is that it offers potential, and existing, subscribers to the ATU-NET, i.e. parent companies, partners, affiliates and merchants, an enhanced architecture for achieving a lucrative and global, or Pan-European electronically accessible commercial market. This is made possible by establishing a centrally managed set of rules that must be accepted and followed by all subscribers to
20 the ATU-NET. In essence, this arrangement requires, as stated above, a membership mechanism that takes account of the ATU domains connected to the ATU master domain, as well as the merchants willing to participate within this enhanced environment.

From a merchant's perspective, access to an ATU payment server will require
25 the merchant to be a member of the ATU-NET. Consumers will be encouraged to join the ATU-NET through, for example, an ATU-NET loyalty program, or the like.

The following types of payment mechanisms are supported by the electronic payment system:

30

- pre-paid jeton cards, i.e. issued by member companies of ATU, or some of the parent companies - this card may be tied to loyalty programs and increase the traffic on the network; and

- pre-paid jeton cards issued by banks, for example:

- in Sweden, it will be the cash card, and

5

- in the USA, it will be Mondex,

the purpose of this payment mechanism is to attract users that are subscribing to competing telephone service providers.

10

The electronic payment system may also be adapted to cater for credit-based and/or debit-based schemes, but such payment systems are not addressed in this patent specification.

15

The architecture of the ATU-NET, which is diagrammatically illustrated, in the form of a block diagram, in Figure 3 of the accompanying drawings, federates scheme-specific payment gateways which can be addressed through the ATU Payment System.

This ATU payment system takes the output of the scheme-specific payment gateway and maps it to a common agreed format that can be interpreted across a wide range of countries, for example, all the ATU countries. This common format and the corresponding flow of messages is outlined in the subsequent description with reference to Figure 6 of the accompanying drawings. The parameters relating to these messages, which will not be described in great detail in this patent specification can, in essence, be considered as a string of bytes composed of pieces of information, such as:

25

- originating payment server;

- destination payment server;

30

- authentication codes;

- method of payment requested by the consumer;

- method(s) of payment supported by the originating payment server;
- transaction ID;
- 5 - acknowledgment messages; and
- amount of value for the transaction.

10 In may be necessary to extend this list, in order to ensure the coherence and security of the transaction.

The rules of ATU-NET form a two-level hierarchy, the rules of ATU-connected domains forming one level, and the rules of the ATU master domain forming the other level. The rules defined at the ATU master domain level are common to all ATU-
15 connected domains and determine how 'clearing' is effected. 'Clearing' means the process of transmitting, reconciling and, in some cases, confirming payment orders prior to settlement. This term is sometimes used, imprecisely, to include settlement.

The architecture and message flow for the ATU-NET for a single-scheme
20 electronic payment system is diagrammatically illustrated, in the form of a block diagram, in Figure 4 of the accompanying drawings. This architecture is adapted for use by a consumer who is using a micro payment scheme, managed by a locally implemented scheme-specific gateway. The manner in which such a scheme operates will now be described with reference to Figure 4 of the accompanying drawings.

25 A consumer in one ATU-connected domain, in browsing the Internet, elects to visit (electronically via the Internet) a merchant's virtual store (www-site) which is hosted in the same ATU-connected domain, and selects a number of items for purchase. If, for any personal reason, the consumer prefers to view the prices, at which the selected
30 items are being offered for sale, in a currency, other than the default currency, i.e. the currency normally used by the merchant, the merchant's payment server holds a copy of the local currency rate and will present the relevant information to enable the prices for the selected items to be calculated in the requested currency. Note, however, that the

final payment (see the subsequent description) will have to be done in the currency related to the supported payment scheme.

At the end of the shopping phase, the MAS-PS (Merchant-Associated Scheme-
5 Payment Server) then presents a record (or summary) of the purchases to the consumer and the final, all-inclusive price to be paid by the consumer, together with a list of supported payment schemes, for example, Proton Card-based scheme.

The consumer selects a preferred means of payment, for example, Proton Card,
10 and presses the pay-button.

The merchant's payment server checks if its domain owns the corresponding payment gateway. With this architecture, it is assumed that no remote ATU domain has to be invoked due to the fact that this is a single-scheme electronic payment system.

15

The request is forwarded towards the local (ATU-connected) Payment Server which activates the scheme-specific payment gateway and transfers value from the consumer's electronic wallet to the merchant's cash register and thereafter to the merchant's bank account.

20

When the transfer of values has occurred, and if no error has been signalled, the payment server then sends an acknowledgment of the transaction to the merchant's server, in order for the latter to start the delivery process. Optionally, the payment server may also initiate the handling of the transaction record (for customer care, billing, etc..).

25

The delivery and record handling processes are not addressed by this patent specification because they are not of relevance to a description of the payment server's mode of operation.

30

The architecture and message flow for an ATU-NET inter-scheme electronic payment system is diagrammatically illustrated, in the form of a block diagram, in Figure 5 of the accompany drawings. This architecture is adapted for use by a consumer who wishes to use a micro payment scheme which, in fact, involves the use of two different

micro payment schemes, each managed by a different payment gateway. The first scheme is the one requested by the consumer, and the second scheme is the one supported by the merchant. The manner in which the electronic payment system of Figure 5 operates will now be described, on the basis that the two different micro payment schemes are not both supported by the merchant's payment server.

A consumer in one ATU-connected domain, in browsing the Internet, elects to visit (electronically via the Internet) a merchant's virtual store (www-site) which is hosted in another ATU-connected domain, and selects a number items for purchase. If, for any personal reason, the consumer prefers to view the prices, at which the selected items are being offered for sale, in a currency, other than the default currency, i.e. the currency normally used by the merchant, the merchant's payment server holds a copy of the local currency rate and will present the relevant information to enable the prices for the selected items to be calculated in the requested currency. Note, however, that the final payment (see the subsequent description) will have to be done in the currency related to the supported payment scheme.

At the end of the shopping phase, the MAS-PS then presents a record (or summary) of the purchases to the consumer and the final, all-inclusive price to be paid by the consumer, together with a list of supported payment schemes.

The consumer then selects his/her preferred means of payment and presses the pay-button.

The ATU-NET payment server, on the merchant's-side, checks if its domain owns the corresponding payment gateway. This will not be the case with this architecture, and a remote ATU domain will have to be invoked due to the fact that this is an inter-scheme electronic payment system. The request must, therefore, be forwarded towards the ATU Payment Server handling the Consumer's Requested Scheme (CRS). This process is totally transparent to the consumer, whose only concern is to be allowed to pay with his/her preferred method of payment.

The flow of requests and actions occurring on both sides (consumer and

merchant), will now be described, on a step-by-step basis, with reference to Figure 5 of the accompanying drawings.

(1) The initial step, in the inter-scheme ATU-NET payment scheme, involves an inquiry being sent by the CRS-PS for transfer of values to the CRS-PG. Before doing so, the CRS-PS will have performed the following actions:

- checked whether the scheme selected by the consumer can accept the amount presented for payment;
- if the consumer has changed his mind about the method of payment (for example, if a previously selected payment method cannot accept the amount presented - see supra), checked if the MAS is a member of the receiving payment gateway (PG);
- checked that the MAS-PG is operational - due to optimization of the protocol, this check is effected locally, by checking that the connection initiated by the MAS-PS has not failed; and
- presented, to the consumer, an updated acceptance form for the transaction, taking into account the latest exchange rates for the currencies involved, and including all fees incurred by using the facility offered by the system.

This transaction will be declared valid and performed if it is presented according to the CRS standards, and there is sufficient electronic value in the consumer's electronic wallet/purse, for example, Smart Card, to cover the purchase. Once the payment order is declared valid, the consumer is permitted to send the electronic value to the CRS-PG.

(2) The amount, corresponding to the payment received in the CRS-PG's cash register, in an electronic format, from the consumer, is credited to the ATU-NET account that the CRS-PG owns in its local bank.

- 5 (3) The CRS-PS, creates a payment order, based on stored data concerning the transaction, and sends it, in a format defined at the ATU master domain level. The order is sent through the communication network to the MAS-PS associated with the MAS-PG.
- (4) The MAS-PS receives the payment order and converts it from inter-linking standards into its own standards.
- 10 (5) The MAS-PS uses its own associated wallet to become the new payer to the merchant. If that wallet is card-based and the value remaining in the card is not sufficient to cover the payment, the MAS-PS loads the wallet from its own bank account, according to the rules that the (local) scheme has defined.
- 15 (6) The wallet transfers the electronic values through its MAS-PG to the cash register of the merchant. Periodically (decided by the scheme operator), values are transferred to the bank account owned by the merchant.
- 20 (7) Finally, the merchant is informed concerning the completion of the payment transaction.
- 25 (8) Each PS has an account with its bank. Periodically, and according to a locally operated bookkeeping process, each CRS payment server instructs its bank to transfer funds, denominated in Euro, from its account to the bank(s) account, associated with the MAS-PS they have been dealing with. The amount of funds transferred is equivalent to the amount of values covered by the payment orders (see step 3 above).

30 It should be noted that it may be efficient for ATU to develop a netting system to minimize the number of bank transfers.

 A variant of the single scheme electronic payment system enables 'fair exchange of value and goods' to be provided for payments which are managed locally by an ATU-

connected domain. Whilst this variant is applicable to the case where the consumer's and the merchant's preferred methods of payment are the same, it implements a flow similar to the inter-scheme electronic payment system of Figure 5 of the accompanying drawings, with the ATU-NET acting as a broker between both parties. This variant
5 offers increased flexibility in setting-up merchant-specific features. For instance, since the values are not transmitted immediately from the consumer's electronic wallet/purse to the merchant's cash register, the delay for forwarding them can be used to ensure that the delivery satisfies the conditions of the sales. In this case, the values would be forwarded to the merchant's cash register only after all of the sales conditions have been
10 satisfied/acknowledged. However, new mechanisms would still have to be defined, for example, for reimbursing, or making reverse payment to, the consumer, in case of non-compliance by the merchant, for example, delivery problems.

The above-mentioned variant will operate in a manner very similar to the inter-
15 scheme electronic payment system of Figure 5, except that the ATU-NET will not be involved, because all actions are taking place within a single (ATU-connected) domain.

In order to avoid the introduction of new terms, and to thereby minimize confusion, the two parts of the variant of the single-scheme electronic payment system will be named in a manner similar to the inter-scheme electronic payment system. The
20 system will, therefore, have a CRS, with its associated CRS-PS and a CRS-PG, and a MAS, with its associated MAS-PS, MAS-PG and electronic wallet.

The CRS-PG includes a cash register associated with a bank account of the domain; similarly, the MAS-PS includes an electronic wallet that can be re-loaded from
25 that same domain's bank account. The MAS-PG's cash register relates to the merchant's bank account.

Thus, in operation, the consumer in one (ATU-connected) domain, in browsing the Internet, elects to visit (electronically via the Internet) a merchant's virtual store
30 (www-site) which is hosted in the same ATU-connected domain, and selects a number of items for purchase. If, for any personal reason, the consumer prefers to view the prices, at which the selected items are being offered for sale, in a currency, other than the default currency, i.e. the currency normally used by the merchant, the merchant's

payment server holds a copy of the local currency rate and will present the relevant information to enable the prices for the selected items to be calculated in the requested currency. Note, however, that the final payment (see the subsequent description) will have to be done in the currency related to the supported payment scheme.

5

At the end of the shopping phase, the MAS-PS then presents a record (or summary) of the purchases to the consumer and the final, all-inclusive price to be paid by the consumer, together with a list of supported payment schemes.

10 The consumer then selects a preferred means of payment for the selected items and presses the pay-button.

The merchant's payment server checks if its domain owns the corresponding payment gateway. As stated above, it will be assumed that this is the case and that a
15 remote ATU domain will not, therefore, have to be invoked. The request is, therefore, forwarded towards the (local) payment system. The flow of requests and actions occurring within the local payment system comprises the following steps:

(1) The initial step involves the CRS part of the payment system (i.e. the CRS-PS)
20 sending an inquiry for transfer of values to the CRS-PG. Before doing so, the CRS-PS will have performed the following actions:

- checked whether the scheme selected by the consumer can accept the amount presented for payment;
- 25 - if the consumer has changed his mind about the method of payment, for example, if a previously selected payment method cannot accept the amount presented - see supra), checked if the MAS is a member of the receiving (albeit local) payment gateway;
- 30 - checked that the MAS-PG is operational;
- presented to the consumer an updated acceptance form for the

transaction, taking into account the latest exchange rates for the currencies involved, and including all fees incurred by using the facility offered by the system.

5 This transaction will be declared valid and performed if it is presented according to the CRS standards, and there is sufficient electronic value in the consumer's electronic purse/wallet, for example, Smart Card, to cover the purchase. Once the payment order is declared valid, the consumer is permitted to send the electronic value to the CRS-PG.

10

(2) The amount corresponding to the payment received in the CRS-PG's cash register in an electronic format from the consumer is credited to the Domain's bank account.

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(3) Depending on the parameters set for the particular merchant, for example, instructions for completion of delivery of goods, a conditional delay elapses before the CRS-PS, creates a payment order, i.e. based on stored data concerning the transaction, and sends it in the format defined at the ATU master domain level. The order is sent to the Payment Server (MAS-PS) associated with the MAS-PG.

20

(4) The MAS-PS receives the payment order and converts it to its own standards.

25

(5) The MAS-PS uses its own associated electronic wallet to become the new payer to the merchant. If that wallet is card-based and the value remaining in the card is not sufficient to make the required payment, the MAS-PS loads the electronic wallet from the domain's bank account according to the rules that the (local) scheme has defined.

30

(6) The electronic wallet transfers the electronic values through its MAS-PG to the cash register of the merchant.

(7) Finally, the merchant will be informed about the completion of the payment

transaction.

- (8) Both payment servers (CRS-PS and MAS-PS) share the same account at the domain's bank; they transfer their values to, and from, this account, and there is, therefore, no need to manage any transfer of funds.

Figure 6 of the accompanying drawings diagrammatically illustrates, in the form of a block diagram, the ATU-NET message flows from the merchant payment server side (ATU_PS_M), the consumer payment server side (ATU_PS_C) and the ATU Master domain side (for updating new addresses, exchange rates, rules etc.).

In the pico payment scheme, values are minted in the master domain and transferred to the ATU-connected domain. The purchase/distribution-flow for pico payments is not illustrated in Figure 6. The payment server supporting the merchant's payment scheme is called the 'Merchant Payment Server' and the payment server supporting the consumer requested payment scheme is called the 'Consumer Payment Server'. It will be seen from Figure 6 that, because the ATU-NET is a payment server extension to existing implementations, the prefix 'Existing' has been added to the Merchant and Consumer Payment Servers for clarifying the architectural difference (see Figure 3).

An electronic payment system, according to the present invention, which is diagrammatically illustrated, in the form of a block diagram, in Figure 7 of the accompanying drawings, includes the ATU-NET, referred to in the preceding paragraphs. The ATU-NET of Figure 7 interfaces with the payment systems which consumers and merchants are offered by the network operator in collaboration with the banks either locally, or through OTC, i.e. a one payment telecom country electronic payment arrangement. As illustrated in Figure 7, the ATU-NET is associated with an ISP (Internet Service Provider) and an AP (Access Provider), for the Internet, on both sides of the system, i.e. the consumer side and the merchant side, and with the ECSP. Thus, within the framework of the system of Figure 7 there is a local responsibility for the market entities in the different countries, for example, members of the AT&T/Unisource alliance, such as, Telia in Sweden, and AT&T in the United States of America.

When a customer has accessed, and is located at, the merchant's commercial www-site and is interested in purchasing a product/service being offered by the merchant, the ATU-NET of the present invention operates as follows:

5

(1) If the customer clicks an ATU-NET payment icon (for example, a suitable trade mark for the service and/or an attractive graphic design), the customer is presented with the price he/she is being asked to pay - if the merchant at the www-site normally specifies prices in a currency other than that in which the customer wishes to pay, the price to be paid by the customer is, as outlined in the preceding paragraphs, translated into the customers own unit of account in his/her own currency. If the merchant has indicated the price in the same currency which the customer has available on his/her own micro payment card, this part of the service is skipped.

15

(2) The customer is asked whether he/she wishes to complete the purchase in the unit of account he/she has selected. If the customer accepts this, the usual procedure for the unit of account is carried out in a manner as outlined in the preceding paragraphs. Instead of the customer's payment going to the merchant, the ATU-NET Payment Server, which supports the customer's unit of account, receives the payment. A payment order is then sent to the payment server which handles the unit of account which the merchant supports. The payment server includes an electronic purse owned by the ATU-NET. The payment is transferred from this electronic purse to the cash register allocated to the merchant in the ATU-NET Payment Server. When this transaction is completed, the merchant receives information that the consumer's payment has been received, so that the merchant can send the goods to the consumer.

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(3) An alternative/added value service which the ATU-NET offers is to defer transfer of payment to the merchant's cash register in the payment server until the customer has taken delivery of, for example, an information service. This guarantees, as stated above, a 'fair exchange of value and goods', so that neither the merchant, nor the consumer, need be exposed to any risk of the

other party defaulting on his/her undertaking.

(4) If trading between payment servers is too asymmetric, some ATU-NET Payment Server purses will be well filled (i.e. have sufficient funds to meet payments), whereas others will be strapped for cash (i.e. insufficient funds to meet payments), appropriate action will be taken to rectify the problem. With a selectable cutoff point, instructions are given for the transfer of currency units of account between the bank accounts with which the ATU-NET servers are associated. This is a service provided by the banks.

(5) Ever watchful, as a guardian angel, over the process outlined above, is the ATU-NET Master Domain, which handles the business regulations and continuously updates the ATU-NET Connected Domains Payment Servers with information on current exchange rates.

The electronic payment system of the present invention is adapted for use in a number of applications which will be directly evident to persons skilled in the art. For example, the electronic payment system could be used as a business adjunct to the activity which Telia and the Swedish banks, such as Sparbanken, S-E Banken, and Handelsbanken, are intending to launch through a national cash card. In particular, the realisation of the Telia/Swedish banks application, or any other similar arrangements between regional network operators and their bankers, will require the network operator, for example, Telia, to operate the service for their domestic market. In other words, the network operator would offer the service to the merchants wishing to use the ATU-NET service as an icon on their commercial www-sites. When a customer clicks the payment icon, the service will be activated, and the network operator will receive a percentage income on each purchase from the merchant. If the purchase includes an exchange between currency units of account, the network operator will also receive a percentage of the profit on the currency exchange, i.e. the difference between the exchange rate applied to customer payment and the cost incurred by the network operator in making major transfers between the currencies.

It will be seen from the foregoing description that the present invention provides

a cost-effective, quick and secure electronic payment system for conversion and cross currency exchange via an open system solution, i.e. one which enables the conversion to take place irrespective of the products, i.e. jeton cards, or the like, the merchant and consumer use to support the electronic unit of account which they themselves have
5 available.

A currently available electronic payment system known as 'Mobidic' can only handle payments that use the Mondex card but has not, as yet, been adapted to handle cash cards. However, in the event that 'Mobidic' is extended to support conversion
10 between units of account, it would still have the serious limitation that both the merchant and the consumer would be required to use the 'Mobidic' product (i.e. Mondex) for it to work. If either of the parties uses another product/supplier to handle his/her own unit of account, this conversion will not work.

15 Thus, the main advantage of the ATU-NET over known systems is that it creates an open general service for conversion between arbitrary electronic units of account and currencies, both present and future.

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CLAIMS

- 5
1. A telecommunications network for handling financial settlement of transactions between consumers and merchants using an electronic payment facility, said transactions relating to products/services purchased by said consumers from said merchants via an electronic trading medium, such as the Internet, each of said
- 10 merchants having a www-site at which products/services are offered for sale to said consumers via said electronic trading medium, each of said consumers having an access unit for accessing said www-sites, characterised in that said network includes activation means for operation by a consumer having an interest in purchasing selected products/services from a merchant; pricing means for presenting to said consumer, in
- 15 response to operation of the activation means, a price required for said selected products/services in a unit of account and currency normally used by said merchant, said payment means being adapted to present said price in another currency, if required by said consumer; payment means for presenting to said consumer a list of electronic payment schemes supported by said electronic payment facility; selection means for
- 20 operation by said consumer to select and confirm a preferred electronic payment scheme from said list; transaction means for accepting, from said consumer, payment for said selected products/services using said selected and confirmed electronic payment scheme, and for crediting an electronic account of said merchant with an amount corresponding to the payment made by said consumer, said transaction means
- 25 being owned and controlled by an operator of said electronic payment facility and adapted to support said consumer's and said merchant's unit of account and currency; transfer means for transferring payment for said selected purchase from said electronic account to a bank account of said merchant, said payment being in the currency used by said merchant; and confirmation means for informing said merchant that payment
- 30 has been received from said consumer and that said selected products/services can be delivered to said consumer.
2. A telecommunications network, as claimed in claim 1, characterised in that said

transfer means are adapted to defer crediting said merchant's bank account with an amount corresponding to the payment made by said consumer until after said consumer has taken delivery of said products/services and said merchant's conditions of sale have been fulfilled/acknowledged by said consumer.

5

3. A telecommunication in that said network is adapted to:

- debit said consumer's electronic account by an amount corresponding to the payment for said selected products/services;

10

- hold said debited amount in escrow; and

- after said consumer has taken delivery of said selected products/services and all conditions of sale have been complied with by said merchant, credit an electronic account associated with said merchant.

15

4. A telecommunications network, as claimed in any preceding claim, characterised in that said activation means include a payment icon displayed on a display screen of said consumer's access unit when said consumer accesses the www-site of said consumer, said icon being clicked by said consumer to indicate an interest in purchasing said selected products/services from said merchant.

20

5. A telecommunications network, as claimed in any preceding claim, characterised in that said pricing means are adapted to present, to said consumer, the price for said selected products/services in his/her own currency, in the event that the price provided by said merchant is in another currency.

25

6. A telecommunications network, as claimed in claim 5, characterised in that said pricing means include currency exchange lists for the currencies of said merchant and said consumer, said lists being updated on the basis of a currency exchange rate prevailing at the date of purchase of said selected products/services; and calculation means adapted to use said currency exchange lists to transpose the price for said selected products/services from said merchant's currency to a currency selected by said

30

consumer, and in that said transaction means are adapted to accept payments in a currency selected by said consumer, and to credit said electronic account of said merchant with an amount, corresponding to the payment made by said consumer, in the currency of said merchant.

5

7. A telecommunications network, as claimed in any preceding claim, characterised in that said network is adapted to handle financial settlement of transactions between consumers and merchants who are subscribers to the same electronic payment scheme, operated by a single network operator, or to different electronic payment schemes operated by different network operators, all of said schemes operating in accordance with a common set of rules, enabling said network operators to conduct business in a homogeneous manner.

8. A telecommunications network, as claimed in claim 7, characterised in that each of said payment schemes is indigenous to a different country and is adapted to operate, nationally, as a single-scheme, independently of the other schemes, and in that said network includes inter-scheme conversion and a cross-currency exchange means adapted to enable subscribing merchants, in each of the different countries, to sell products/services to consumers in any one of the other countries, irrespective of a consumer's currency.

9. A telecommunications network, as claimed in claim 8, characterised in that each electronic payment scheme includes a scheme-specific payment server for making payments, via a payment gateway, for products/services selected by a consumer, said payments being credited to an electronic account of a merchant from whom the products/services have been purchased.

10. A telecommunications network, as claimed in claim 9, characterised in that said scheme-specific payment servers of each of said electronic payment schemes, operating in accordance with a common set of rules, are federated, said federation being adapted to interconnect said scheme-specific payment servers and a centralised master server for:

- generic payment methods;
- managing centralised services; and
- 5 - developing new generic features and/or services for said network.

11. A telecommunications network, as claimed in claim 10, characterised in that said generic payment methods include, inter alia, pico payments and international payment schemes, and in that said centralised services include, inter alia, a foreign exchange
10 rate server.

12. A telecommunications network, as claimed in any of claims 9 to 11, characterised in that said single-scheme includes a MAS-PS for presenting, to said consumer:

- 15 - a record, or summary, of the selected purchases;
- a final, all-inclusive, price to be paid for said purchases; and
- 20 - a list of electronic payment schemes supported by said network, said consumer selecting a payment scheme, from said list, for making payment for said purchases;

and in that said MAS-PS activates said scheme-specific payment gate and transfers
25 payment for said purchases, in electronic form, from an electronic card/wallet of said consumer to an electronic account/cash register of said merchant and thereafter to a bank account of said merchant.

13. A telecommunications network, as claimed in any of claims 8 to 11,
30 characterised in that said inter-scheme conversion and a cross-currency exchange means are adapted to use two different electronic payment schemes, each managed by a different payment gateway, and in that a merchant, from whom a consumer wishes to purchase products/services, is a subscriber to one of said electronic payment schemes

and the consumer is a subscriber to the other of said electronic payment schemes.

14. A telecommunications network, as claimed in claim 13, characterised in that said electronic payment scheme, supported by said merchant, includes a MAS-PS for
5 presenting, to said consumer:

- a record, or summary, of the selected purchases;
- a final, all-inclusive, price to be paid for said purchases; and
- 10 - a list of electronic payment schemes supported by said network, said consumer selecting a payment scheme, from said list, for making payment for said purchases;

15 said MAS-PS being adapted, on determining that payment for said purchases will be made via a payment gateway responsible for management of said electronic payment scheme supported by said consumer, to forward a request for payment to a scheme-specific payment server adapted to handle a Consumer's Requested Scheme (CRS).

20 15. A telecommunications network, as claimed in claim 14, characterised in that said electronic payment scheme, supported by said consumer, includes a CRS-PS adapted to send, to a CRS-PG, an inquiry for transfer of payment for said purchases, said transfer being declared valid and performed, when presented according to CRS standards and provided there is sufficient electronic value in said consumer's electronic
25 wallet/purse to cover said purchases, an electronic value of said payment being sent by said consumer to said CRS-PG.

16. A telecommunications network, as claimed in claim 15, characterised in that said CRS-PS is adapted, before sending said inquiry to said CRS-PG, to:

- 30
- check whether a payment scheme selected by said consumer can accept the amount presented for payment;

- if said consumer decides to change a method of payment for said purchases, check whether a MAS is associated with a receiving payment gateway;

- check that a MAS-PG is operational; and

5

- present, to said consumer, an updated acceptance form for said transaction, taking into account the latest exchange rates for the currencies involved, and including all fees incurred by using said electronic payment scheme offered by said network.

10

17. A telecommunications network, as claimed in claim 16, characterised in that said CRS-PS is adapted to make said MAS check, in the event that a consumer changes said payment method because a previously selected payment method cannot accept an amount presented for payment.

15

18. A telecommunications network, as claimed in claim 16, or claim 17, characterised in that said CRS-PS is adapted to determine whether said MAS-PG is operational by checking that a connection initiated by said MAS-PS has not failed.

20

19. A telecommunications network, as claimed in any of claims 15 to 18, characterised in that said CRS-PG is adapted to credit an amount, corresponding to said payment received from said consumer for said purchases, to a bank account owned and controlled by said CRS-PG.

25

20. A telecommunications network, as claimed in claim 19, characterised in that said CRS-PS is adapted to:

- create a payment order, based on stored data concerning said transaction; and

30

- send said payment order, in a format defined by said centralised master server, via a communication network to a MAS-PS associated with said MAS-PG.

21. A telecommunications network, as claimed in claim 20, characterised in that said

MAS-PS is adapted to:

- receive said payment order from said CRS-PS and convert it from inter-linking standards into its own standards; and
- make payment to said merchant, in accordance with said payment order, using its own associated electronic wallet.

22. A telecommunications network, as claimed in claim 21, characterised in that said electronic wallet of said MAS-PS is a card-based electronic wallet.

23. A telecommunications network, as claimed in claim 22, characterised in that said MAS-PS is adapted, in the event that a value remaining in said card-based electronic wallet is insufficient to cover said payment order, to load said wallet from its own bank account, according to predefined rules.

24. A telecommunications network, as claimed in any of claims 21 to 23, characterised in that said electronic wallet is adapted to transfer, via an associated MAS-PG, electronic values, required to fulfill said payment order, to a cash register of said merchant, in that said cash register is adapted to periodically transfer electronic monetary values held therein to a bank account owned by said merchant, and in that said network is adapted to inform said merchant concerning completion of said payment transaction.

25. A telecommunications network, as claimed in any of claims 20 to 24, characterised in that each payment server owns and controls a bank account, and in that each CRS-PS is adapted to periodically, and according to a predefined bookkeeping process, instruct an associated bank to transfer funds, denominated in Euro, from its account to a bank account, associated with MAS-PSs with which each CRS-PS has been dealing, said transfers being for an amount equivalent to a total value of said payment order(s).

26. A telecommunications network, as claimed in any of claims 20 to 25,

characterised in that, depending on conditions of sale established for said merchant, said CRS-PS is adapted to delay creation of said payment order in order to ensure that said conditions of sale have been complied with by said merchant.

- 5 27. A telecommunications network, as claimed in any preceding claims, characterised in that payment mechanisms supported by said electronic payment schemes include pre-paid jeton cards issued by either an operator of said electronic payment facility, or by banks.
- 10 28. A telecommunications network, as claimed in claim 27, characterised in that jeton cards issued by banks include cash cards, SET, Proton and Modex.
- 15 29. A telecommunications system for trading using an electronic medium, such as the Internet, in which subscribers to said system include merchants having a www-site for offering products/services for sale, and consumers having an access unit for accessing said www-sites to purchase said products/services from said merchants, characterised in that said system includes an electronic payment system supported by a telecommunications network as claimed in any of the preceding claims.
- 20 30. A telecommunications system, as claimed in claim 29, characterised in that said system is adapted to handle financial settlement of transactions between consumers and merchants who are subscribers to different electronic payment schemes operated by different network operators, each of said schemes being indigenous to a different country and adapted to operate, nationally, as a single-scheme, independently of the
- 25 other schemes, in that all of said schemes are adapted to operate in accordance with a common set of rules, enabling said network operators to conduct business in a homogeneous manner, and in that said system is adapted to offer each of said nationally operated electronic payment schemes to subscribing consumers and merchants in the respective countries.
- 30 31. A telecommunications system, as claimed in claim 30, characterised in that said electronic medium is provided by the Internet, and in that each of said consumers subscribe to an Internet access provider and an Internet service provider in their

respective countries, and each of said merchants subscribe to an Internet access provider, an Internet service provider and an electronic payment service provider in their respective countries.

- 5 32. A telecommunications system, as claimed in any of claims 28 to 30, characterised in that said consumer access units each include a personnel computer (PC) having a display screen, and a data modem and associated software for accessing, and trading at, said www-sites of said merchants.
- 10 33. A telecommunications network for handling financial settlement of transactions between consumers and merchants using an electronic payment facility, said transactions relating to products/services purchased by said consumers from said merchants via an electronic trading medium, such as the Internet, each of said merchants having a www-site at which products/services are offered for sale to said
- 15 consumers via said electronic trading medium, each of said consumers having an access unit for accessing said www-sites, characterised in that said electronic payment facility is supported by a telecommunications architecture adapted to provide:
- a plurality of electronic payment schemes, each one of which is indigenous to a
20 different country and adapted to operate, nationally, as a single-scheme, independently of the other schemes, in accordance with a common set of rules, each of said nationally operated payment schemes having an electronic account, owned and controlled by an operator of said scheme; and
 - 25 - an inter-scheme conversion and cross-currency exchange facility for said electronic payment schemes that enables merchants subscribing to each of said national schemes to trade with subscribing consumers, irrespective of the payment scheme to which said consumers subscribers, or the consumer's currency, each of said scheme-specific electronic accounts being adapted to
30 receive payments from a subscribing consumer, for products/services purchased from a merchant, in said consumer's currency, and to make corresponding payments to a scheme-specific electronic account, to which said merchant subscribers, in a currency selected by said merchant;

in that said telecommunications network includes transfer means for transferring payments received by a scheme-specific electronic account for a subscribing merchant to a bank account of said merchant, said payment being in the currency used by said merchant; and confirmation means for informing said merchant that payment has been
5 received from said consumer and that said selected products/services can be delivered to said consumer.

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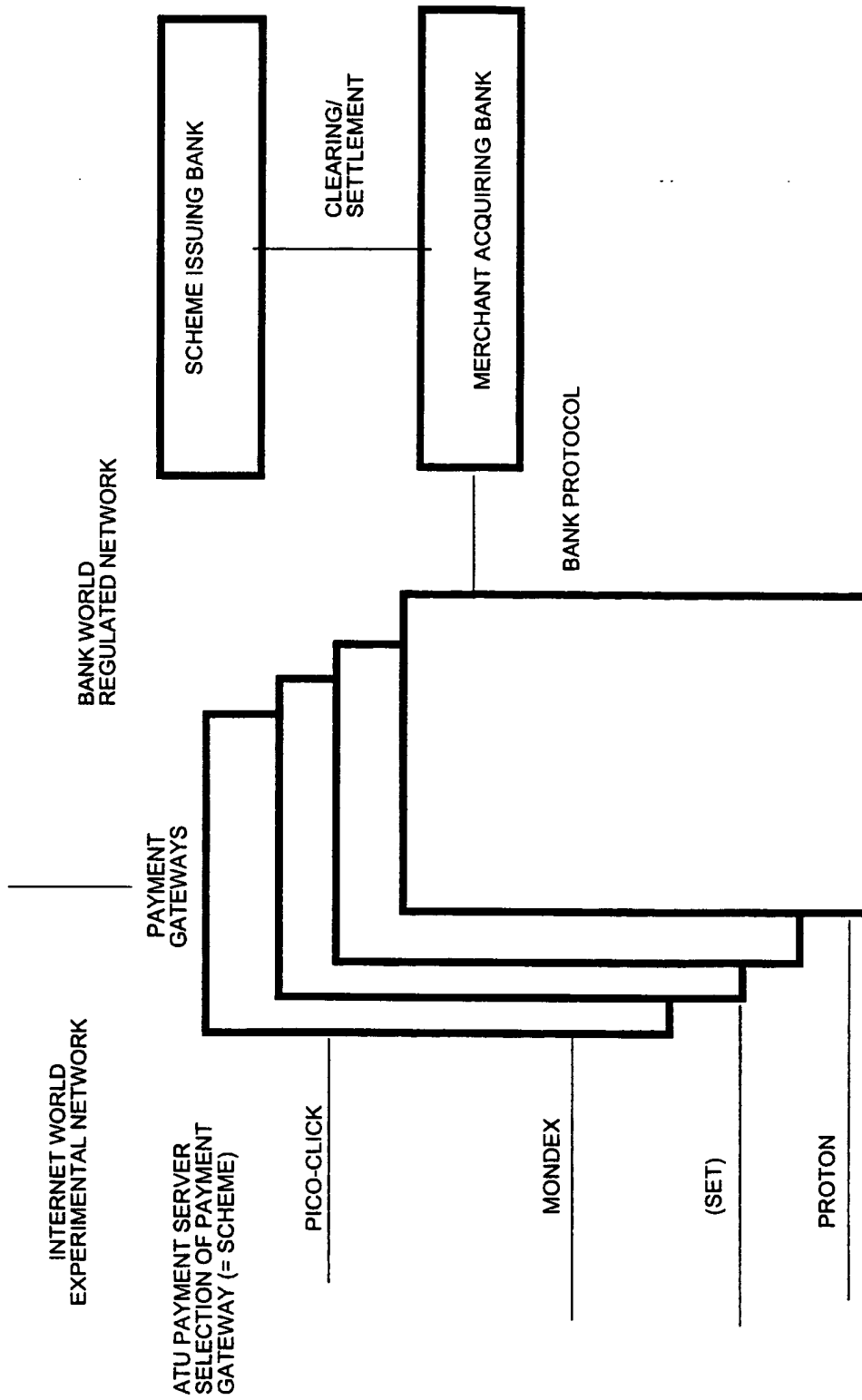


FIGURE 1

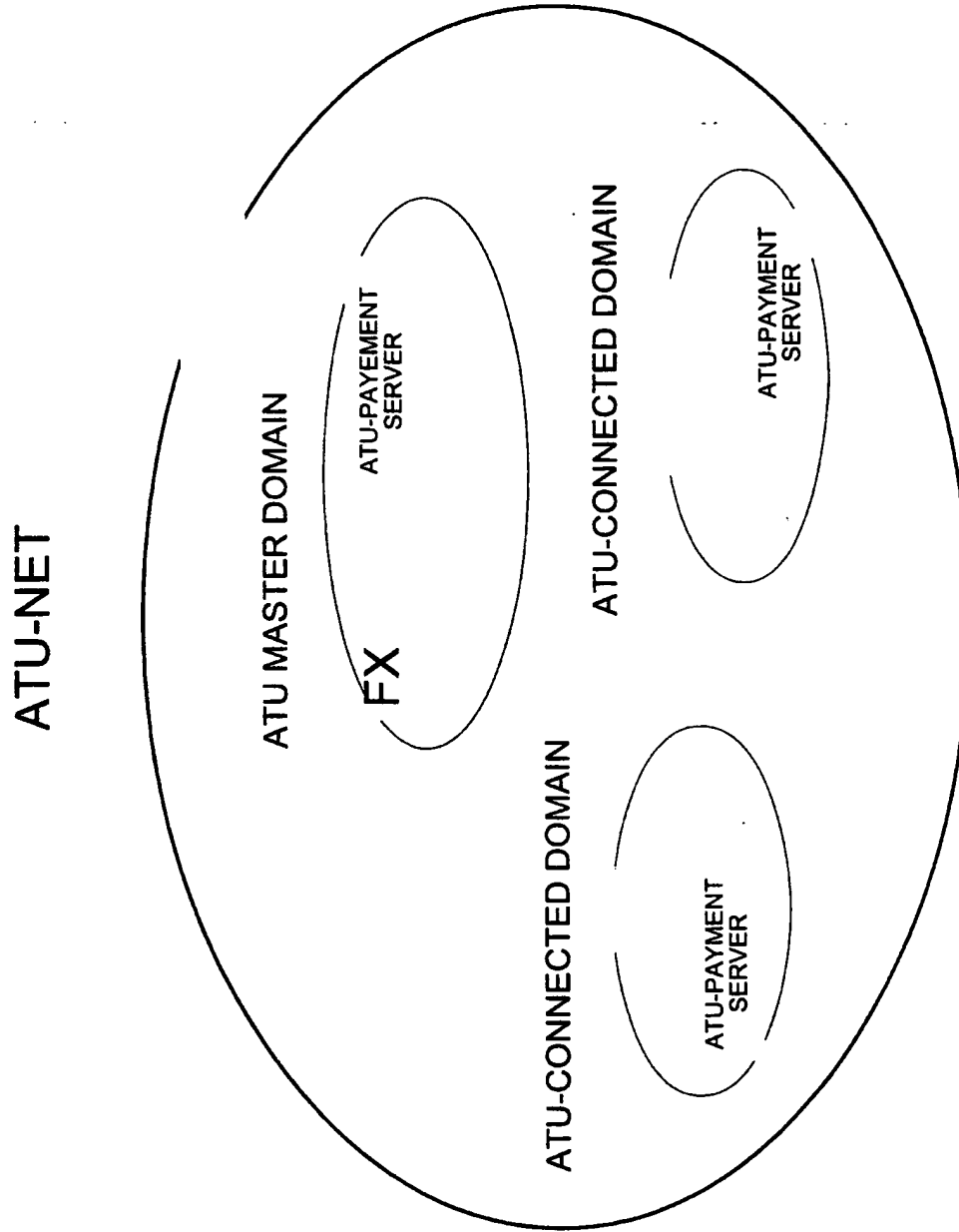


FIGURE 2

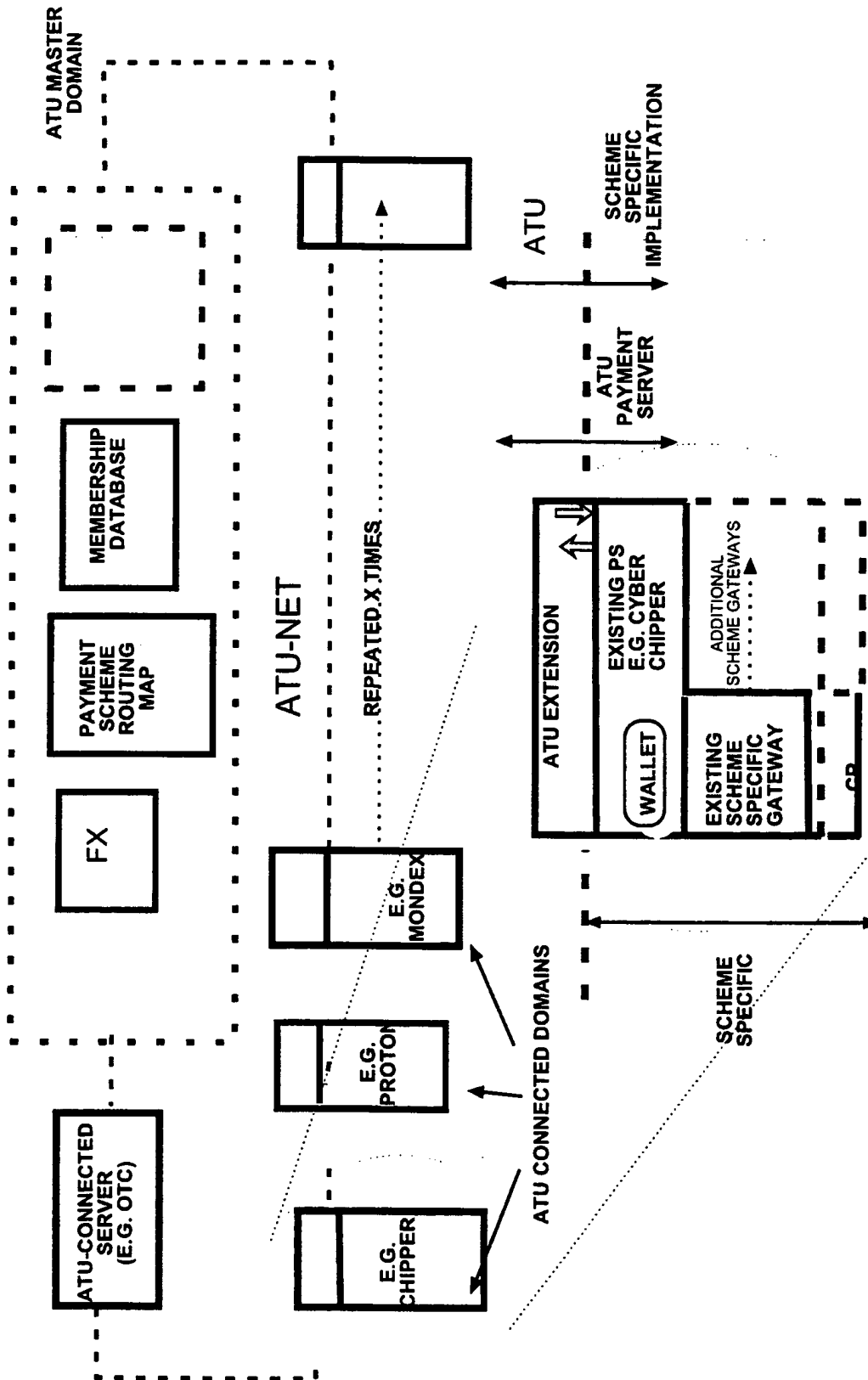


FIGURE 3

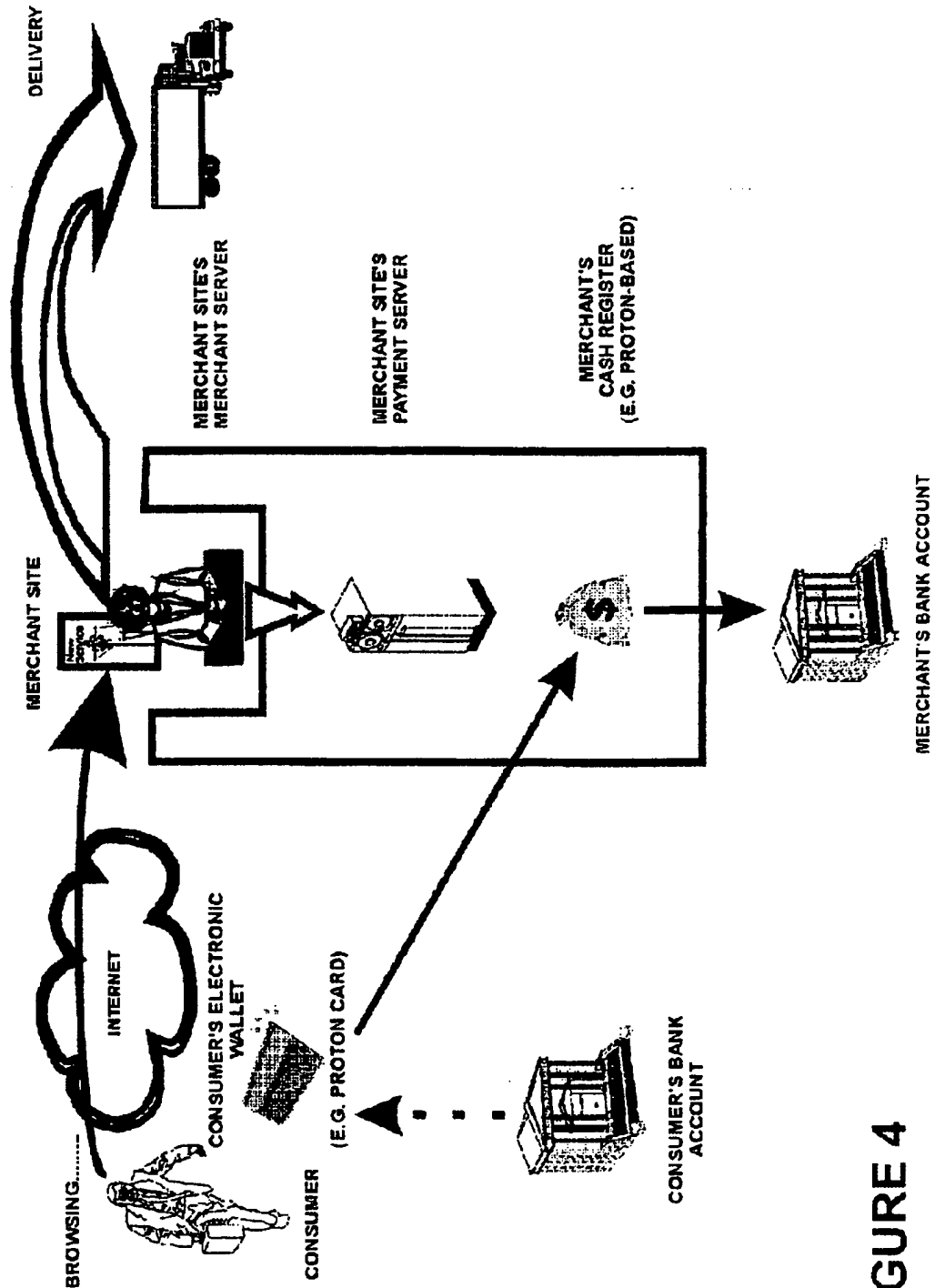


FIGURE 4

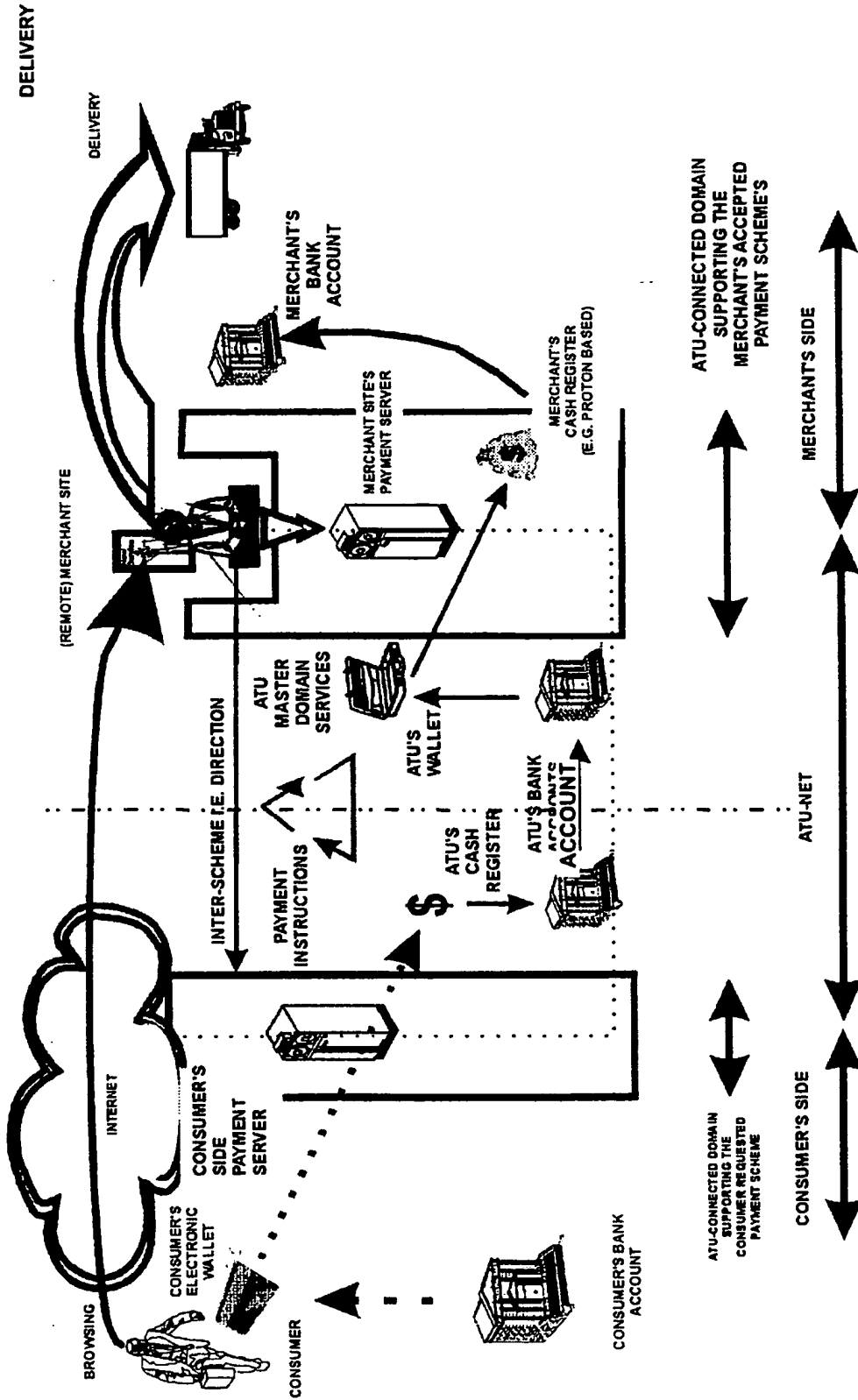


FIGURE 5

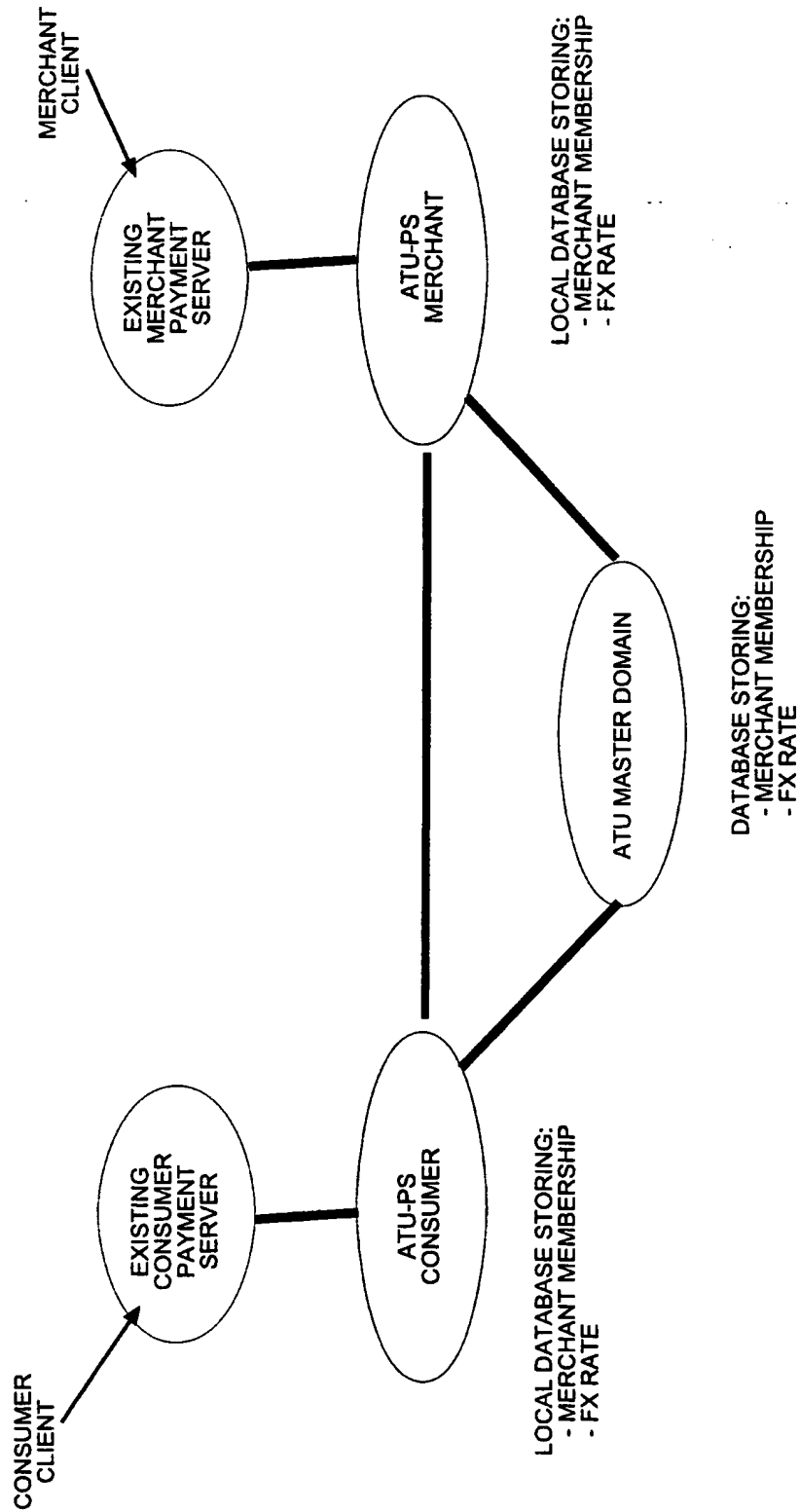


FIGURE 6

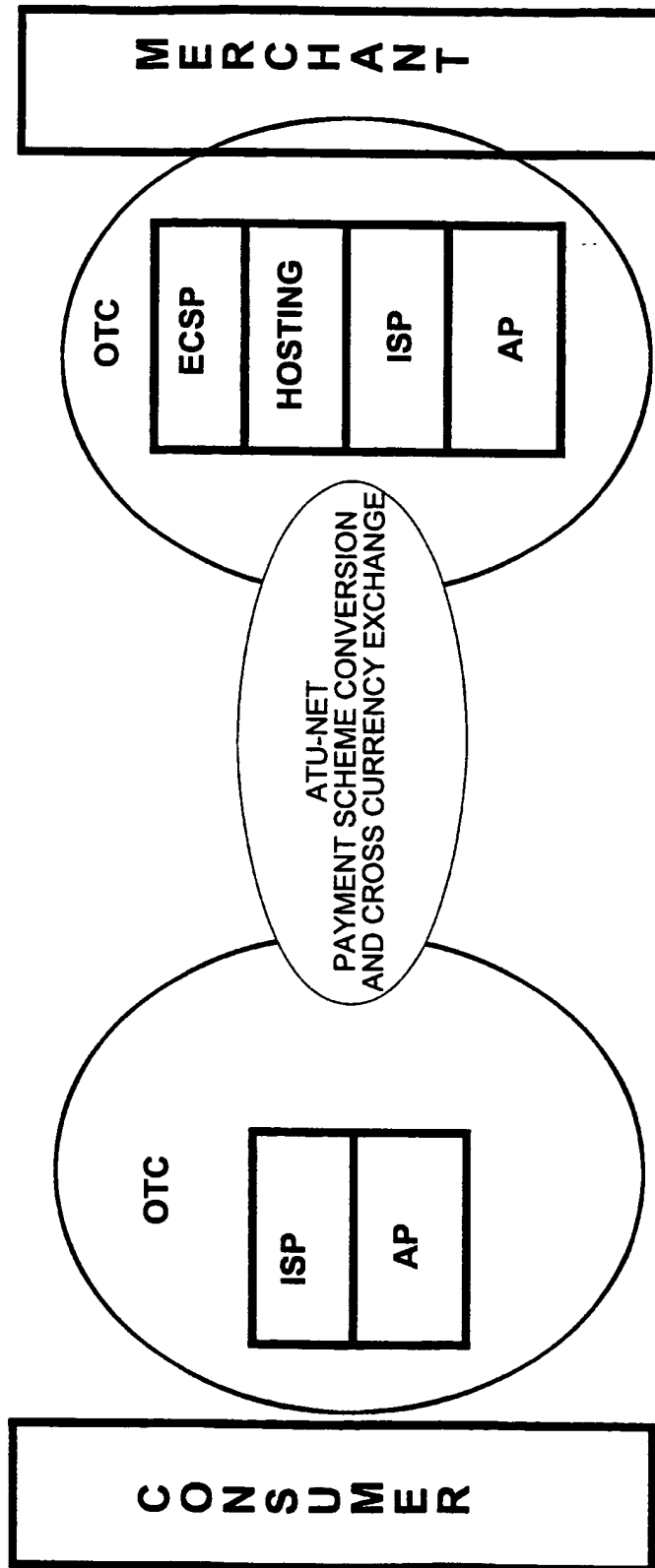


FIGURE 7